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An approach to the taxonomy and phylogeny of Oxygastridae sensu Fleck, 2018 based on larval and imaginal morphology (Odonata: Anisoptera)

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Keywords:

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new genera;
new tribes;
new subfamilies.

Abstract. – Based on larval and adult characters, a preliminary phylogeny of Oxygastridae *sensu* Fleck, 2018 is formulated. The subgenus *Mesocordulia* May, 1992 is accepted at genus rank, notably due to the presence of an extraordinary larval character, the genus *Presba* Barnard, 1933 is restored and includes *P. venator* and *P. legator* **comb**. **nov**., and new taxa are proposed : *Juliecordulia* **n**. **gen**. (monotypic, type species *Idomacromia lieftincki*), *Siriusocordulia* **n**. **gen**. (monotypic, type species *Syncordulia serendipator*), *Theischingerophya* **n**. **gen**. (monotypic, type species *Austrophya monteithorum*), Juliecorduliini **n**. **trib**. (genus *Juliecordulia*), Oxygastrini **n**. **trib**. (genera *Oxygastra*, *Neocordulia* and *Mesocordulia*) with *Oxygastra* as sister group to (*Neocordulia* + *Mesocordulia*), Lathrocorduliini **n**. **trib**. (genus *Lathrocordulia*), Austrophyiini **n**. **trib**. (genera *Austrophya* and *Theischingerophya*), Oxygastrinae **n**. **subfam**. (tribes Juliecorduliini and Oxygastrini), Macromidiinae **n**. **subfam**. (genus *Macromidia*), Syncorduliinae **n**. **subfam**. (genera *Syncordulia*, *Presba*, and provisionally *Siriusocordulia*), Micromidiinae **n**. **subfam**. (genus *Micromidia*), Austrophyinae **n**. **subfam**. (tribes Austrophyini and Lathrocorduliini). The Macromidiinae is considered a sister group to the Oxygastrida n. taxon (Oxygastrida: ((Oxygastrinae: Juliecorduliini + Oxygastrini) + Syncorduliinae + Micromidiinae + (Austrophyinae: Austrophyini + Lathrocorduliini))).

Fleck G., 2026. – An approach to the taxonomy and phylogeny of Oxygastridae sensu Fleck, 2018 based on larval and imaginal morphology (Odonata: Anisoptera). *Faunitaxys*, 14(01) : 1 – 11.

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Introduction

About two decades ago, I noticed the presence of a remarkable larval character on the abdominal pleurites of *Oxygastra curtisii*, a taxon considered to be a Corduliidae *sensu lato* (or Libelluloidea *incertae sedis* according to Dijkstra et al. 2013). Since then, I was able to examine many larvae belonging to all families of Anisoptera, and especially all those of Corduliidae s.l., at least at the generic level. *Oxygastra* shares its unique abdominal character, which I regard as apomorphic, with a small number of genera of these Corduliidae s.l.. Thus, in my previous publications, I considered the genera *Oxygastra* (South-West Europe), *Austrophya* (Australia), *Lathrocordulia* (Australia), *Macromidia* (Tropical Asia), *Micromidia* (Australia), *Neocordulia* (Central and South America) and *Syncordulia* (South Africa) as closely related and forming the Oxygastridae, with a very different meaning from that of Bechly (1996) (see Fleck 2018 and Fleck in Fleck et al. 2020). The worldwide spotty distribution of this group made by an assemblage of forest species with strongly limited dispersal abilities is best explained by an old Gondwanian origin rooted in the Cretaceous (Fleck 2018).

The adults of this family are fairly easily distinguished from the Corduliidae *sensu stricto*, for example by an anal loop that is never boot-shaped and separated by at least two rows of cells from the posterior margin of the wing, by a proximal margin of the discoidal triangle of the hind wing in a distal position relative to the posterior vein of the arculus, and by an abdomen without a lateral longitudinal keel. However, they do not have any distinctive characters that allow them to be easily separated from Corduliidae s.l.. This is why this group has never been clearly identified by the characters of the adults.

This work, which is based essentially on the study of the external morphological characteristics of adults and larvae, should be considered as a note providing some systematic information at the generic and supra-generic levels and offering an initial internal overview of the Oxygastridae *sensu* Fleck. It thus establishes a basis for future investigations. A broader morphological study of all Corduliidae s.l. is currently underway and should result in a more comprehensive and illustrated publication by the author.

Materials and methods

Terminology related to the 'penis' is taken from May (1992). Terminology related to wings follows that of Bechly (1996), modified by Fleck & Nel (2003) and Fleck et al. (2003, 2020).

Abbreviations: Md, mandible ; FW, forewing ; HW, hindwing ; S1–10, abdominal segments 1 to 10 ; F-0, F-1 respectively larval ultimate and penultimate stadium.

The larva of at least one species per genus of all Corduliidae s.l. has been directly examined (the genera of Corduliidae s.l. correspond to those listed as Libelluloidea *incertae sedis* by Dijkstra et al. except *Pseudocordulia*, which I consider to belong to Synthemistidae *sensu* Fleck [including Synthemistinae, Gomphomacrominae and *Pseudocordulia*, see Fleck & El Adouzi 2013]). The characters of the only known specimen of *Austrophya montheitorum*, a relative young larval stage, are taken from the literature and personal

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communications with G. Theischinger. The adult of at least one species per genus of Corduliidae s.l. could be directly examined except for *Nesocordulia*, *Hesperocordulia*, *Lathrocordulia* and *Micromidia*. The adults of *Idomacromia lieftincki*, *Syncordulia serendipator* and *S. legator* could not be examined either. Thus, for certain characters related to adults, it was necessary to refer to the literature.
The characters studied are limited to external morphology, as some of the larval stages available to me are exuviae that do not allow access to the internal anatomy.

Results and discussion

1 – *Mesocordulia* May, 1991, validation of a subgenus elevated to genus rank (De Marmels, 2024).

In my previous studies (Fleck 2018), I noticed that the genus *Neocordulia* (including the subgenera *Neocordulia* and *Mesocordulia*), due to its great intrageneric variability, could perfectly incorporate *Oxygastra curtisii*. Indeed, neither the wing venation, nor the body colouration, nor the secondary genitalia of the male, including the morphology of the penis, nor the anal appendages of the male allow for clear distinction between the two genera (Fleck 2018). The genus *Neocordulia* consists of two very distinct subgenera, and the idea of combining all these closely related forms into a single, fairly variable genus (*Oxygastra*) has been proposed (Fleck 2018). It should be noted, however, that the subgenus *Mesocordulia* can be fairly easily separated from the remaining *Neocordulia* and *Oxygastra*. On this basis, De Marmels (2024) formally elevated the subgenus *Mesocordulia* to generic rank.

During a trip to Ecuador in 2023, I had the opportunity to collect *Mesocordulia* larvae of different species and to discover that they possess an extraordinary stridulatory organ. Given that I attach considerable importance to this unique feature within the Odonata in terms of evolution and morphology and that *Mesocordulia* and *Neocordulia* are likely sister groups, it is now preferable to consider *Mesocordulia*, *Neocordulia* and *Oxygastra* as three distinct but closely related genera. In this paper, these "*Oxygastra* s.l." are grouped together in the tribe Oxygastrini **n**. **trib**.
May (1992) established the subgenus *Mesocordulia* on the basis of adult characters, then Novelo-Gutiérrez & Ramírez (1995) and Carvalho & Kloosterman (2001) proposed larval characters. With the gradual accumulation of knowledge about the group, some of these characters are losing their relevance. For example, the presence or absence of a 'cercal ventrobasal tooth' in adult males is no longer an absolute criterion for separating the two genera, since *Neocordulia morocostai*, like *Mesocordulia*, lacks this feature. The number of premental setae in the larvae is also no longer an absolute criterion (9-11 premental setae for *Mesocordulia* [and no longer 9], 10-13 for *Neocordulia* [and no longer 11-13] and also 10-13 in *Oxygastra*). And finally the number of lateral spines on the abdomen of the larva (the larva of a new, undescribed species of *Mesocordulia* has, like *Neocordulia*, lateral spines on S8 and S9, pers. obs.).

Emended diagnosis of the genus Mesocordulia

Larvae. – They are very distinctive and should not be confused with those of other genera : presence of an extraordinary stridulatory apparatus involving part of the paraprocts and epiproct, the remarkable *pars stridens* is presented here for the first time (Fig. 1) [note : this organ is present in a new species awaiting description by the author, in

Fig. **1**. *Mesocordulia* sp. larval right paraproct showing the *pars stridens* of a stridulatory apparatus.

M. batesi (pers. obs.), and in *M. caudacuta* (De Marmels pers. com.), the larvae of other species are not known or not described ; this character, apparently unique among Odonata, can be used on its own to define the genus *Mesocordulia* ; detailed work on this remarkable apparatus is in progress (Fleck in prep)] ; sixth antennomere shorter than the seventh ; antennal flagellum short and thin, scape and pedicel broad ; frontal plate strongly projected anteriorly, at least half as long as wide, and with a dorsoventral concavity and/or excavation in its distal part ; in dorsal view, long and slightly convergent postocular lateral margins (head with a massive appearance and broad, sub-rectangular occiput) ; 5-6 palpal setae ; pronotal shield strongly developed with large epaulet-like lateral margins and lacking pair of posterolateral cornicula ; S10 ventral length about that of S9 but extremely reduced dorsally to a thin beading bordering the base of epipoct ; epiproct and paraprocts of about equal length, cerci strongly triangular, flattened and about as long as wide.

Adults. – Male S8 sternite without proximal protuberance (possibly shared with *Neocordulia pedroi*, but this species is described on an unique teneral laboratory reared specimen that could have partly aborted the ecdysis) ; male S10 dorsal crest always present, and except for *M. campana*, strongly developed (shared with *Oxygastra*) ; male cerci robust, subcylindrical/club-shaped and without tooth or marked protuberances ; female with abdominal segment 10 hardly more than 1/2 as long middorsally as along lateroventral carina, or less ; female with small denticles along the anterolateral angle of each metafemur.

2 – Differences between *Oxygastra* and *Neocordulia*.

The boundary between the genera *Oxygastra* and *Neocordulia* is rather indistinct. For example, *Neocordulia volxemi* retains a number of plesiomorphies and appears to be a kind of intermediate between *Oxygastra* and more derived species of *Neocordulia*. The few characters that differentiate the two genera are not clearly cut and involve a ratio of relative size or quantity and most characters taken independently is more of an interspecific than intergeneric value.
Oxygastra can be distinguished from *Neocordulia* by the following combination of characters :

Larvae. – Antennae about as long as the length of head (in *Neocordulia* antennae are apparently shorter, at least less than 0.82 the length of head [0.81 in *N. carlochagasi*], but as only a restricted number of larvae are known/ described, complementary study is required to confirm this result) ; frontal plate apparently less developed, the apex not extending beyond the level of antennal scape (in *Neocordulia* the apex seems to reach the level of pedicel or flagellum, complementary study is required to confirm this result) ; as for adults, legs generally shorter, with length of hind legs 18.2-19.3 mm and hind femur+tibia 13.1-13.8 mm (n=3) (generally longer in *Neocordulia*, except *N. volxemi* [hind leg 18.7 mm, n=1], *N. carlochagasi* (femur+tibia 13.8-14 mm, n=2) and probably *N. fiorentini* given the adult measurements).

Adults. – FW and HW bridges with generally 1 crossvein, more rarely 2 (*Neocordulia* has generally 2 crossveins, except *N. volxemi* and *N. setifera* having 1-2 crossveins) ; as for the larvae, legs generally shorter, with length of metafemur 6.9-7.3 mm [n=10 males] (generally longer in *Neocordulia*, except *N. volxemi* [7.2-7.5 mm, n=2], probably *N. fiorentini* given the natural variability [7.35 mm, n=1]) and also very probably *N. carlochagasi* given the other measurements and given the length of larval legs [see above]) ; dorsal part of abdomen with yellow markings on sombre background (distinct yellow spots absent, except for *N. volxemi* presenting a pattern of coloration similar to that of *Oxygastra*) ; S8 sternite with a moderately bulged and not biconical/subconical proximal half (in most of *Neocordulia* presence of a well-developed biconical structure, in *N. matutuensis* and *N. machadoi* presence of a simple subconical structure apparently better developed than in *Oxygastra*, in *N. pedroi* absence of any biconical or subconical structure, but see above) ; male S10 dorsal crest better developed (in *Neocordulia* the crest is less pronounced, sometimes reduced to a posterior protuberance) ; ventral basal teeth of cerci apparently better developed (except in *N. mambucabensis*, but this species shows strongly oblique teeth contrary to *Oxygastra* ; in *N. matutuensis* this structure seems to be close to that of *N. mambucabensis* with also oblique teeth visible in dorsal view, nevertheless available figure and description lack accuracy ; lastly for the poorly described and poorly illustrated *N. pedroi* and *N. machadoi* no published information and accurate figure are existing to date for this character).

Possible other characters :

Ax1, Ax2 and Arculus. – In *Oxygastra* the gap between Ax1 and Ax2 is generally slightly but distinctly greater than the space between other antenodals and the spring of arculus is placed about midway between Ax1 and Ax2, more rarely slightly shifted basally or distally. In *Neocordulia* (and *Mesocordulia*) the gap between Ax1 and Ax2 seems to be not greater than that of other antenodals, and the spring of arculus seems to be at Ax2 or between Ax1 and Ax2 but distinctly closer to Ax2. Unfortunately, the wings are not always figured in publications and for several of them it is simply mentioned “arculus proximal to second antenodal” (like *Oxygastra*), thus this character needs to be confirmed.

Ante-subnodal space. – The space limited by the RP3/4 fork and subnodus between RA and RP1/2 presents crossvein(s) at base in *Oxygastra* (and *Mesocordulia*). This space is apparently lacking crossveins in *Neocordulia* (a convergence to Austrophyinae **n**. **subfam**. and possibly to *Siriusocordulia* **n**. **gen**. within Oxygastridae). Nevertheless, this potential interesting character is rarely described and the absence of picture of wings for several species do not allow to confirm its systematic presence in the genus. Complementary study would be welcome.

HW Mspl. – *Oxygastra* shows a variable HW Mspl, from almost absent to well or rather well defined on 2-4 cells in males and 2-6 in females. It is apparently less developed than in several *Neocordulia*. Nevertheless for *N. pedroi*, *N. machadoi*, and *N. matutuensis* it is indicated by the authors “Mspl poorly defined” or “Mspl indistinct”.

Hamuli posteriores. – The general shape of the hamuli posteriores of *Oxygastra* is intermediate between those of *Mesocordulia* and *Neocordulia*. The branches of *Oxygastra* have a laterodorsal and medioventral orientation, so they appear well separated in lateral view (as in *Mesocordulia*) and in ventral view (as most *Neocordulia*). *N. maurocostai* has a structural organisation of branches very similar to that of *Oxygastra* (thus *Neocordulia* hamuli are not always divided into lateral and medial branches as stated by the original diagnosis). The medioventral branch of *Oxygastra* bears denticles, similar to the homologous median branch of several *Neocordulia* species. However, it should be noted that several *Neocordulia* species have not been adequately described or illustrated, making it difficult to gain a comprehensive understanding of the hamular structure for this genus. Further research in this area would be welcome. It remains that the hamuli posteriores of *Neocordulia* seem to be rather variable, and the relevance of this structure at the generic level should be investigated. The hamuli of *N. biancoi* and *N. maurocostai* differ greatly from those of other *Neocordulia* that have been properly illustrated, and the degree of difference is similar to that observed between *Oxygastra* and other *Neocordulia*. *N. androgynis* and *N. santacatarinensis*, based on May (1992, Fig. 2C) and Costa et al. (2008, Fig. 5), show respectively a kind of ventral and dorsal branch in lateral view and seem to represent intermediate forms between *Oxygastra* and most other Brazilian *Neocordulia*. Costa et al. (2010, Fig. 2) illustrate a hamulus of *N. pedroi* in lateral view showing ventral and dorsal branches (but see above).

In an interesting way, from three male specimens caught the same days in St-Guilhem-le-Désert (France) in 2002, two exhibit clearly branches with dorso-ventral development and branches almost not separated in lateral view, conferring to the hamuli an appearance very close to that found in *Neocordulia*.

3 - New genera

3.**1** - Based on the genus *Idomacromia* Karsch, 1896.

Years ago, the late Jean Legrand gave me a couple of F-1 larvae of African *Idomacromia lieftincki* Legrand, 1984 from Guinée, Mont Nimba, Zougué River where a good number of adults have been seen and caught. He should have described the larva of this species, but unfortunately, he passed away before he could do so. The larval stage is therefore still awaiting a formal description. These larvae differ significantly from those of *Idomacromia proavita* Karsch, 1896, the type species of the genus. Given that the adults of both species also exhibit distinct differences, it appears rather clearly that *Idomacromia lieftincki* should be placed in a distinct genus.

The description of *I. jillianae* Dijkstra & Kisakye, 2004, the third and last known species of the genus, is based on two females. The male and the larva of this species remain undescribed. In the actual state of knowledge and given female morphology, I consider *I. jillianae* closely related to *I. proavita* and belonging to the same genus.

Differences between *I. proavita* (+ *I. jillianae* for wings and female characters) and *I. lieftincki*:

Larvae. – *I. proavita* does not have the typical Oxygastridae supplementary sclerites on ventral S8, whereas *I. lieftincki* clearly possesses them (this means that *I. lieftincki* must be placed in the Oxygastridae *sensu* Fleck, while *I. proavita* must remain excluded from it, nonetheless it could represent a sister group of this family [see Fleck & Legrand 2006]). The body of *I. proavita* is strongly depressed contrary to that of *I. lieftincki*, it is also much more pilose and distinctly more elongated. The head is unusually strongly transverse, much more than that of *I. lieftincki*. The pronotal shield of *I. proavita* is of very different built, less developed laterally, better developed longitudinally and without a pair of posterior pilose blunt cornicula (pronotal shield of *I. lieftincki* is almost identical to those of *Oxygaxtra* and *Neocordulia*). The wing pads are strongly divergent, a rare character within Libelluloidea, whereas they are parallel in *I. lieftincki*.

Adults. – The anal loop of *I. proavita* + *I. jillianae* has three or four cells at its anterior margin, it is even considered as a generic diagnostic character, but, like the vast majority of Libelluloidea with sack-like anal loop, *I. lieftincki* has only two cells. The nodus of all wings of *I. proavita* and *I. jillianae* is distinctly in a more basal position than that of *I. lieftincki*. *I. proavita* has a distinct FW Mspl, a rare character within Corduliidae s.l., absent in *I. lieftincki* (in *I. jillianae* the FW Mspl seems to be present even if weakly marked). The male hamule and penis structures are strongly different between the two species, for example the first segment of the penis of *I. lieftincki* lacks the pair of lateral bulges, the second segment of the penis of *I. lieftincki* exhibits a remarkable and unique structure, and the distal segment of *I. proavita* is unique having bilobed median process and a lateral origin of the flagellum (the distal segment of the penis of *I. lieftincki* is remarkably similar to that of *Oxygastra*, *Neocordulia* and *Mesocordulia*, for details related to *Idomacromia* see Legrand 1984). The three last abdominal segments of the female *I. proavita* + *I. jillianae* are strongly modified with noteworthy S8 laterodistal tergite ending as a triangular process back-directed, vulvar scale of ovipositor developed as very large blades reaching the level of cerci on S10, ventral and lateroventral parts of S9 and S10 strongly produced posteriorly giving a L-shaped appearance of the segments in lateral view, and cerci very long (about twice middorsal length of S10) and divergent (*I. lieftincki* has no S8 lateroventral process, extremely reduced vulvar scale, no S9 and S10 peculiar ventral and lateroventral development, and no elongated and divergent cerci, for details see Dijkstra & Kisakye 2004).

As most of these differences are generic in nature, *I. lieftincki* cannot be longer considered belonging to *Idomacromia*.

Genus ***Juliecordulia*** **n**. **gen**.

ZooBank : https://zoobank.org/215EAED4-0F7B-4B00-BDBA-CB70EFDCDDB2

Type species. – *Idomacromia lieftincki* Legrand, 1984

Included species. – Only *J. lieftincki* **comb**. **nov**.

Etymology. – After Julie Ibarrondau, who has been helping me in the field for a couple of years, assisting with collecting and rearing Odonata, and after *Cordulia* genotype of the Corduliidae s.s. and largely used as suffix in the taxonomy of Corduliidae s.l. and Corduliidae s.s.

Diagnosis

Larvae (based on two F-1 specimens). – The larva is morphologically extremely close to those of *Neocordulia* species. This is probably due to a plesiotypic appearance shared with most of Oxygastrinae **n**. **subfam**. (see below) - except the strongly derived genus *Mesocordulia* - and only few characters allow to separate them. Frontal plate moderately developed, reaching the level of antennal pedicel ; distal margin of labial palp with 8-9 crenulations most of them bearing 8-10 raptorial setae ; distal margin of abdominal tergites without small median brush of scale-like setae ; laterodorsal surface of abdominal tergites with long, fine and sinuous setae.

Adults. – Synthoracic pleurites with distinct pale/citron-yellow markings contrasting on a sombre background (symplesiomorphy only shared with *Syncordulia gracilis* and *Macromidia* and to a lesser extend to *Micromidia atrifrons* - showing two dorsal spots - within Oxygastridae) ; wings with hypertriangles crossed (symplesiomorphy only shared with *Macromidia* within Oxygastridae) ; submedian spaces with supernumerary crossvein(s) ; FW AA+CuA field poorly developed ; male hamulus apparently unique, massive, transverse, outer side pointed, inner side rounded and fringed with short bristles ; second segment of vesica spermalis with a pair of lateral apical scythe-shaped spur covering the third segment (see Legrand 1984, text, and Fig. 4 ; this remarkable structure is apparently unique within Trichodopalpida Bechly, 1996 or even Libelluloidea, only the Synthemistidae *Pseudocordulia* seems to also have expansions on second segment of the vesica spermalis, but they are not apical, they are blunt, conical, and are covering the fourth segment, thus they are considered not homologous to the structure observed in *J. lieftincki*, pers. obs.) ; hood of the third segment of the vesica spermalis not bilobed, claw-like ; male cerci strongly built with bifid apex made by acutes triangular branches ; female pseudo-ovipositor with two very short and widely separated lobes.

3.**2** - Based on the genus *Syncordulia* Selys, 1882.

Dijkstra et al. (2007) added two new *Syncordulia*, *S. serendipator* and *S. legator*, to the two already known *S. gracilis* (Burmeister, 1839) and *S. venator* (Barnard, 1933), and illustrated and diagnosed in a key all species. They proposed also a diagnosis for the genus. Unfortunately, this diagnosis does not allow to separate *Syncordulia* from several other genera of Oxygastridae *sensu* Fleck, as well as few others like *Hesperocordulia*. This lack of pertinence is partly due to the great intrageneric variability of the genus *Syncordulia*. This variability is also well argued by Dijkstra et al. (2007), who mention with relevance that "morphologically, *Syncordulia* falls into three distinct groups :

(**1**) *S. gracilis* (*Syncordulia* s.s.) ;
(**2**) *S. legator* and *S. venator* (*Presba*) ;
(**3**) *S. serendipator*. The remarkable morphological diversity might warrant the reinstatement of *Presba* and the creation of a third genus."

I totally agree with this argument and this article provides an opportunity to take the plunge.

Note on Syncordulia larvae

The publication of Barnard (1937) is the only paper known to date dealing with *Syncordulia* larvae. Based on material collected between 1930 and 1933, the author described the larva of *Syncordulia venator* from reared specimens, and described also another larva by supposition, with potential generic differences and provisionally assigned to *Syncordulia gracilis*. Due to the discovery of new species and the known sympatry of species, as well as the lack of knowledge about the distribution of *Syncordulia* dating back more than 90 years, only the larva of *S. venator* is known with certainty, which is of little use for comparison. Therefore, the larval characters are not used in this paper. This is unfortunate, because they may be important in matters of taxonomy and phylogeny. It is urgent to undertake the study and description of the larvae of the remaining species.

Genus ***Syncordulia*** Selys, 1882

[for *Gomphomacromia* (*Syncordulia*) *gracilis* (Burmeister, 1839)]

Type species. – *Epophthalmia gracilis* Burmeister, 1839

Included species. – Only *S. gracilis*.

Diagnosis

Adults. – Back side of occiput with a pair of cornicula, and back side of genae with a pair of low bulges close to occipital cornicula (character absent in « *Syncordulia* » *venator*, other species not studied, thus a complementary study is needed to validate this potential apomorphy) ; synthorax with distinct pale stripes contrasting on sombre background (symplesiomorphy

only shared with *Juliecordulia* and *Macromidia* within Oxygastridae) ; male S1 without a pair of ventral spines ; male hamule not pincer-shaped/folded, erect, longer than genital lobe, and shaped like a paw with four claws at apical edge (this shape of hamulus seems to be unique within Libelluloidea) ; male with abdomen (slightly) constricted at S7-S8 ; male epiproct with a pair of median minute spines directed dorsally at two-thirds of its length and with a remarkable apical broad pad, this pad with dorsal surface flattened, bearing long setae (dense at antero-lateral part) and bearing an antero-dorsal bilobed small scale-like structure (this kind of epiproct is unique within Libelluloidea) ; female vulvar scale with inconspicuous appressed and incurved lateral lobes not extending beyond posterior margin of S8 tergite.

Genus ***Presba*** Barnard, 1933, **stat**. **rev**.

Type species. – *Presba venator* Barnard, 1933

Included species. – *P. venator* and *P. legator* Dijkstra, Samways & Simaika, 2007 **comb**. **nov**.

Barnard (1933) erected a new genus *Presba* to receive the species *P. piscator* and *P. venator*. But Lieftinck (1961) found that *P. piscator* was a synonym for *Syncordulia gracilis* and therefore *Presba* fell into synonymy with the genus *Syncordulia* Selys, 1882. Due to the presence (or absence) of characters considered supraspecific, the genus *Presba* is restored.

Diagnosis

Adults. – Back of occiput without a pair of cornicula (*P. venator* was the only *Presba* species available to me for study, the presence/absence of cornicula should be verified in *P. legator*) ; male S1 with a pair of ventral spines ; male hamulus shorter than genital lobe, strongly folded, the fold being sub-horizontal, defining a ventral and a dorsal lobe, and bearing denticles along the edge of ventral lobe (the presence of denticles should be verified in *P. legator* to determine whether they are a generic or a specific feature) ; ancestral abdominal colour pattern still recognisable but affected by the invasion of triangular or subtriangular black spots on the sagittal portion (thus the ancestral entire pale spots are divided longitudinally into two symmetric part rejected laterally), as with the ancestral pattern distal fourth/fifth of S3-9 largely blackish (this abdominal pattern of coloration is unique within Oxygastridae) ; female vulvar scale with lobes as long or longer than the third of S9 sternite, finger like or petal-like ; S9 sternite strongly prolonged beneath S10 (in ventral view, at the sagittal line, visible length of S10 less than 1/10 of that of S9).

Genus ***Siriusocordulia*** **n**. **gen**., Fleck, Dijkstra, Samways & Simaika

ZooBank : https://zoobank.org/C4EC686A-B7D3-48F4-A814-4A20B416CB7D

Type species. – *Syncordulia serendipator* Dijkstra, Samways & Simaika, 2007

Included species. – Only *S. serendipator* **comb**. **nov**.

Etymology. – After Louis Sirius Fleck, son of the author of this paper, in celebration of his birthday, and after *Cordulia*, genotype of the Corduliidae s.s. and largely used as suffix in the taxonomy of Corduliidae s.l. and Corduliidae s.s.

Diagnosis

[The diagnosis is essentially based on the information provided by Dijkstra et al. (2007) and on photographs found on the internet, as no material was available to me for direct study].

Adults. – Synthorax largely green metallic ; male S1 without a pair of ventral spines ; male hamulus massive, longer than genital lobe, strongly folded, the fold being sub-vertical defining an external and an internal lobe ; abdominal S3-8 with pale spots occupying apical fourth of the segments (this pattern of coloration is unique within Oxygastridae, and all traces of the ancestral colouring pattern are no longer recognisable since ancestral pattern shows distal fourth/fifth of S3-9 largely blackish) ; cerci extremely stout (in dorsal view about 50% of the length has a width of at least one fourth of the length, in lateral view about 60% of the length has a width of at least one fourth of the length), robustly angled ventrally at *ca* basal 1/3 and laterally at *ca* distal 1/3 ; male epiproct extremely broad, almost as long as wide and with distal bifurcate triangular branches greatly diverging ; female vulvar scale with subrectangular and very broad lobes, each being more than twice as wide as long and bearing a pair of laterodistal cornicula slightly upturned.

3.**3** - Based on the genus *Austrophya* Tillyard, 1909.

Austrophya monteithorum Theischinger, 2019 is exclusively known from a single larva of relative early instar. This larva is admittedly morphologically similar to the only other known species of the genus, *A. mystica*, but the differences between the two are such that *A. montheitorum* can be placed in a distinct genus. In fact, Theischinger long placed the unique larva in a separate genus called genus '*L*' (see Theischinger 2001), Hawking & Theischinger (2004) mention "an undescribed new species or genus close to *Austrophya mystica*", and Theischinger & Endersby (2014) attributed it to *Austrophya* with doubt "?*Austrophya* sp." and "There are marked morphological and size differences between *A. mystica* and *A.* sp. It is not considered certain that *A.* sp. is congeneric with *A. mystica*". In a personal communication, Theischinger told me that *A. montheitorum* could indeed be placed in a new genus, but that he had preferred to adopt a rather conservative position, leaving me the option of creating a new genus.

Note on the larva of Austrophya mystica

The seventh antennal segment is constricted at mid-length, appearing almost as if it were composed of two sub-antennomeres. The proximal one bears long setae, while the distal one is devoid of long setae and displays a sub-microscopic granulose surface on the ventral side. This character has not been mentioned or illustrated in the literature until now. The posterior part of the occiput bears a pair of small, distinct, blunt lateral tubercles. This character has not been mentioned in the literature until now, but is visible in the drawing by Theischinger and Watson (1984) and was later reproduced by Theischinger (2001). These characters are visible on the four specimens in my possession (three F-0 and one F-1), and are therefore not teratological, but rather belong to the genus and species diagnosis.

Genus ***Theischingerophya*** **n**. **gen**.

ZooBank : https://zoobank.org/2E22C754-40F2-4FAA-8FA0-BFD883686EC3

Type species. – *Austrophya monteithorum* Theischinger, 2019

Included species. – Only *T. monteithorum* **comb**. **nov**.

Etymology. – After Günther Theischinger for his regular assistance, but above all for his contribution to our knowledge of adult Odonata and their larvae, and the suffix *phya* ("stature" in Greek) appearing in the name *Austrophya*, *Austrophya* being the closest relative of the new genus.

Diagnosis [in parentheses the state in *Austrophya*]

Larvae. – Seventh antennomere not divergent (divergent) ; seventh antennomere apparently not divided into two sub-antennomeres (divided, see above) ; sixth antennomere wide, with length *ca* 1.5 the width, and not oval (extraordinary wide, distinctly wider than long, and remarkably oval) ; fourth and fifth antennomeres subtrapezoidal widest near apex (subcircular and widest at mid-length) ; fourth antennomere about twice as wide as long (as long as wide) and fifth about as wide as long ; frontal plate not sub-triangular (often subtriangular) ; postocular margins with two strongly developed lateral tubercles (tubercles absent) ; occipital posterior margin without tubercles (tubercles present) ; base of prementum not large, its width less than 4/10 of premental maximal width (base large, more than 5/10 of premental maximal width) ; distal part of prementum ['ligula'] well produced an distinctly subtriangular (moderately produced and grossly semicircular) ; pronotal lobes rounded, prominent, markedly - but not excessively - backwardly directed (very strongly backwardly directed, at right angle, with straight lateral margin) ; no dorsal nor lateral spine or protuberance (distinct lateral spines on S9).

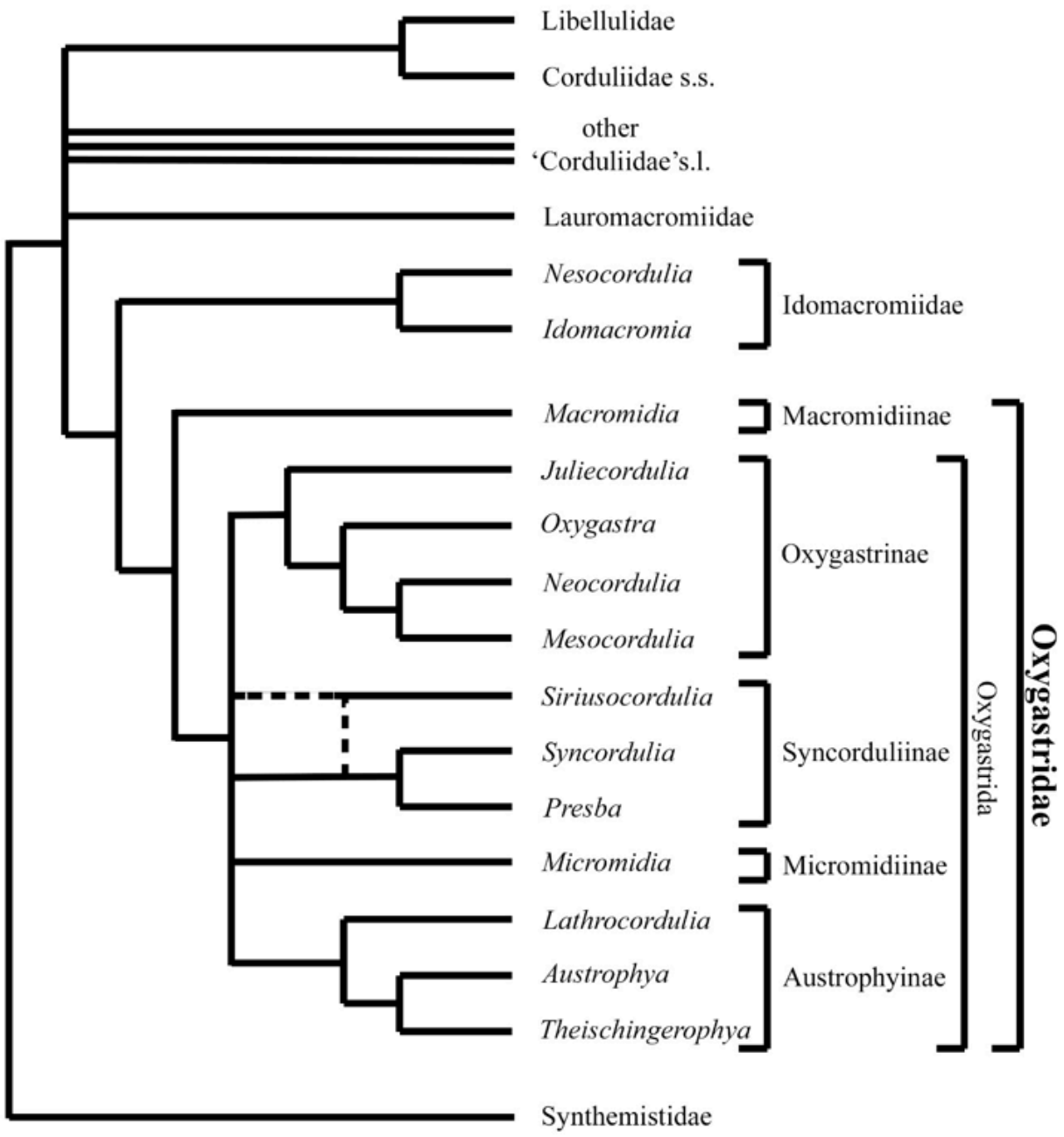

Fig. **2**. Phylogenetic tree of Oxygastridae within Libelluloidea based on morphological characters. For clarity, tribes are not mentioned in the figure; see text.

4 - Classification and elements of suprageneric phylogeny.

A phylogenetic tree of Oxygastridae within Libelluloidea based on larval and imaginal characters is proposed (Fig. 2). This may help readers to gain an overview of the phylogenetic relationships. The list of synapomorphies supporting each node inside the Oxygastridae, as well as additional diagnostic characters for the Oxygastridae and the new subfamilies and tribes introduced in this article, are presented and discussed below. The Synthemistidae sensu Fleck, 2013 (Synthemistidae + Gomphomacromiinae + *Pseudocordulia*) are considered to be the sister group of remaining Libelluloidea. These remaining Libelluloidea, also known as Trichodopalpida Bechly, 1996, are united by various synapomorphies, including the notable presence of *raptorial setae* on the distal margin of the larval labial palps. The Libellulidae and Corduliidae s.s. are considered to be sister groups due to the presence of synapomorphies like a HW triangle recessed to arculus or slightly basal to it in the ground plan, an anal loop boot-shaped with well defined midrib in the ground plan, a FW subtriangle with three cells in the ground plan, or an abdomen with a distinct lateral carina. Entities between the Synthemistidae and (Libellulidae + Corduliidae s.s.) are called Corduliidae s.l.

Oxygastridae *sensu* Fleck, 2018

Main synapomorphies

Larvae. – Ventral part of S9 of late instar larvae with an extraordinary pair of additional triangular sclerites, located between the sternite and the pleurites (not to be confused with post-pleurites, see Fleck 2018).

Adults. – In the ground plan, abdomen with a typical medio-dorsal yellow-orange pattern of coloration made up of more or less rounded and lanceolate longitudinal shapes (this motif, which is manifestly derived, is found in *Oxygastra*, *Austrophya* and *Syncordulia* and certain species of *Neocordulia*, *Macromidia* and *Micromidia* ; it can be considered an atavistic character that appears only in certain species but is part of the ground plan of the Oxygastridae, i.e. the common ancestor of all these genera must have had a dorsal abdominal colour pattern similar to that currently seen in *Oxygastra* or *Syncordulia*).

Other diagnostic characters (see Fleck 2018, Fleck in Fleck et al. 2020, 2024)

Larvae. – Greatly polymorphic, rather robust in appearance, never strongly depressed, often more or less densely covered with small scaly bristles ; frontal plate present, but very variably expressed, weakly marked in *Oxygastra* and *Lathrocordulia*, strongly developed in *Mesocordulia*, but never appearing as a conical projection ; antennae with 7 segments, varying greatly in size and robustness ; functional part of the eyes never highly developed, not or only slightly raised dorsally, and never excessively developed laterally ; distinct groove on the ventral side of the premenum typical of most Corduliidae s.l. and s.s. and Synthemistidae (Theischinger & Fleck, 2003) ; mask robust with prementum at least as wide as long (*Micromidia*), most often wider than long ; prementum with the distal margin of the labial palps equipped with well marked to strong teeth, never digitiform, more or less rounded (not pointed triangular, not dagger-like) and bearing long and robust setae raptores, these fairly numerous to very numerous (>5, most often >10) ; postocular lateroventral part of occiput never greatly enlarged ; pronotal shield often ending laterally in a pair of more or less marked cornicula or a pair of epaulets ; legs never excessively long (larvae never spider-like) with femora and tibia quite often bearing robust, aligned, regularly spaced setae ; abdomen without spines or mediodorsal tubercles ; pterothecae not divergent ; abdominal lateral spines present or absent, if present, never strongly developed and visible on S8 and S9 or simply on S9.

Adults. – Generally black to brown in colour (exceptionally reddish), with metallic green reflections, at least on the thorax, and with presence or absence of yellow or pale - exceptionally orange - markings ; labial palps with movable hook and palpal spine strongly reduced, but often quite distinct and appearing respectively as a button and a pointed tooth of small size ; male tibial keel usually present on the three pairs of legs, absent or very reduced on the middle legs in *Micromidia rodericki* and the sister genera *Austrophya* and *Lathrocordulia* ; tarsal claws without hypertrophied ventral tooth ; abdomen without lateral longitudinal carina ; S2 male auricles apparently without denticles ; male S2 genital lobe moderately to well developed, generally pilose ; hamulus of male secondary genitalia mostly bifid or bipartite ; terminal segment of penis, in the ground plan, with a laterally flattened median process bearing a median distal ventral lobe variably expressed and a median dorsal flagellum (strongly derived in *Micromidia* and *Lathrocordulia*).

Wings. – FW Ax1 and Ax2 better developed than other antenodals, and distal antenodals not thickened, often not aligned ; sectors of arculus united at base or united on a very short distance (approximate in HW but not fused in some *Neocordulia* and *Mesocordulia*) ; discoidal triangle free ; proximal margin of HW discoidal triangle distal to arculus posterior closure ; hypertriangles free, except in *Macromidia* and *Juliecordulia* ; median spaces free ; HW submedian space with two crossveins (CuP crossing and distal closure), except *Juliecordulia* and most *Macromidia* having additional crossvein(s) ; anal loop separated by at least two rows of cells from HW posterior margin, never foot shaped, compact and somewhat polygonal (*Macromidia*) or sack-shaped with less than three cells at anterior margin ; FW Mspl absent except in *Macromidia* (moderately marked).

Macromidiinae **n**. **subfam**.

ZooBank : https://zoobank.org/09935A5D-2552-4383-847C-3C9CA5D73DE4

Includes only the genus *Macromidia* Martin, 1907

This taxon is very distinct and identified by a mosaic of numerous autapomorphic and symplesiomorphic characters. A set of supposed plesiomorphies places this group sister of Oxygastrida n. taxon (see below) gathering the remaining Oxygastridae.

Diagnosis

Larvae [based on F-0 *M.* cf. *genialis*, n=5 and F-0 *M. ishidai*, n=1]. – Antennae not modified with seven segments and as long as or slightly longer than head length (plesiomorphy) ; frontal plate moderately developed and subrectangular ; lateral margins of prementum strongly divergent with distal greater width *ca* 2.5 that of basal width ; labial setae rather numerous with premental setae 15-17 and with palpal setae 9-11 ; Md with remnant of molar crest, better indicated on right Md (plesiomorphy, a molar crest is rarely found in Trichodopalpida Bechly, 1996, apparently unique within Oxygastridae) ; pronotal lateral cornicula moderately developed (plesiomorphy).

Adults. – Synthorax with distinct yellow markings (plesiomorphy) ; Rspl present ; Mspl present at least in FW (FW with Mspl is unique within Oxygastridae) ; hypertriangles crossed (considered plesiomorphic but the polarity of this character is difficult to establish) ; MA and MP distinctly and regularly divergent from ca level of RP3/4 fork to wing margin (polarity difficult to establish since variable in the outgroups) ; submedian space often with supernumerary crossveins (here not considered in the ground plan and also not as a plesiomorphy since probable basal species like *M. donaldi* has no supplementary crossvein) ; anal loop compact, somewhat polygonal with CuA (“gaff”) straight and shorter than anterior margin, and without midrib (considered plesiomorphic, unique within Oxygastridae) ; penis strongly derived, particularly variable from a species to another, with noteworthy distal segment reduced to strongly reduced without long flagellum and with apparently strongly modified or strongly reduced lobe (the outstanding intrageneric great diversity suggests that the penis is strongly modified from the ground plan).

Note on Md molar organisation

The molar crest is arched, connects a dorsal and a ventral cusp and bears a third less developed cusp in median part, this last slightly closer to the ventral cusp on the right Md.

Oxygastrida **taxon**. **nov**.

Included taxa. – Oxygastrinae **n**. **subfam**., Austrophyinae **n**. **subfam**., Micromiidinae **n**. **subfam**. and Syncorduliinae **n**. **subfam**.

Synapomorphies

Larvae. – No molar crest on Md (late stadia of *Syncordulia*, *Siriusocordulia* and *Theischingerophya* not examined/unknown).

Adults. – HW anal loop elongate, sack-like and with less than three cells at anterior margin.

Note on Md molar organisation

The molar crest is absent, but in the ground plan the cusps are still placed close to the virtual arched line that was originally occupied by this crest. On the right Md, the median cusp is shifted close to the ventral cusp and slightly displaced distally, conferring a "triangular" cuspid organisation rather than an "aligned" one ; on the right Md, the median cusp tends to be close to the ventral cusp.

Oxygastrinae **n**. **subfam**.

ZooBank : https://zoobank.org/2A29C3A5-F678-46DE-A08E-D7EB466D8F16

Included taxa. – Juliecordulini **n**. **trib**. and Oxygastrini **n**. **trib**.

Synapomorphies

Adults. – Rspl present in FW and HW (convergent to Macromidiinae **n**. **subfam**. within Oxygastridae) ; Mspl at least weakly indicated in HW and absent in FW ; FW postdiscoidal field with two rows of cells extending on a very long distance, from triangle to level of Rspl or distal to it near wing margin ; anal loop elongated with more than 12 cells in males and 14 in female and with CuA (“gaff”) rather strongly bent ; anal loop with well-defined not zigzagged midrib ; first segment of the vesica spermalis lacking pair of laterodistal bulges (convergent to Macromidiinae **n**. **subfam**. within Oxygastridae) ; male S10 with variably developed dorsal crest or excrescence.

Other diagnostic characters

Third segment of vesica spermalis with well developed lateral flap in the ground plan (poorly developed in *Mesococordulia campana*, polarity difficult to establish since present in numerous Synthemistidae, and in close outgroups like *Idomacromia* or *Cordulephya*) ; distal segment of vesica spermalis with homogenous build (compare Fig. 3 with vesicae spermalis figured by May 1992 and Legrand 1984 ; polarity difficult to establish) ; male cerci at least rather massive and/or divergent (shared with *Siriusocordulia* **n**. **gen**.).

Juliecorduliini n. trib.

ZooBank : https://zoobank.org/DEAF07FE-1C40-49EA-9C14-B63EF8625ADC

Includes only the genus *Juliecordulia* **n**. **gen**.

Diagnosis

That of the genus, see above.

Oxygastrini n. trib.

ZooBank : https://zoobank.org/9C76F404-FDA9-4A0C-B642-C5410C4083D9

Included taxa. – Genera *Mesocordulia* May, 1992, *Neocordulia* Selys, 1882 and *Oxygastra* Selys, 1870.

Synapomorphies

Larvae. – Both Md with molar cusps arranged in triangle (the triangle is very well marked in *Oxygastra* and in described/available *Neocordulia* ; in *Mesocordulia* it appears little more variable, very well marked in a undescribed species, but less marked on the left Md of *M. batesi* and *M. caudacuta*) ; distal margin of abdominal tergite with a dorsal clump of setae variably expressed.

Adults. – Thorax without distinct pale/citron-yellow markings contrasting on sombre background (convergent to Austrophyinae **n**. **subfam**., some Micromiidinae **n**. **subfam**. and *Siriusocordulia* **n**. **gen**.) ; hypertriangles free (convergent to Austrophyinae n. subfam, Micromidiinae **n**. **subfam**. and Syncorduliinae **n**. **subfam**.) ; male hamuli posteriores with same structural construction ; male S10 with, in the ground plan, further development of dorsal keel (transformed to a distal spine in some *Neocordulia*).

Other diagnostic characters

Adults. – Submedian spaces without supernumerary crossvein (also present in Austrophyinae **n**. **subfam**., Micromidiinae **n**. **subfam**. and Syncorduliinae **n**. **subfam**.)

The genera *Neocordulia* and *Mesocordulia* are considered sister taxa by the presence of shorter larval antennae, gap between Ax1 and Ax2 not distinctly greater than gap between other antenodals, arculus close to Ax2, and possible HW Mspl better developed. All these characters need to be confirmed by complementary study (see above).

Micromidiinae n. subfam.

ZooBank : https://zoobank.org/8A3EA247-AB5D-47D7-88D3-6E6FFA0084C1

Includes only the genus *Micromidia* Fraser, 1959.

Synapomorphies

Larvae. – They are very distinctive and should not be confused with any other Odonata larva. Subcylindrical aspect and extremely narrow with a length/width ratio > 4 for exuviae (unique within Corduliidae s.l. and s.s.) ; head with strongly marked rectangular/squarish shape ; functional part of eyes greatly reduced and not prominent ; distal margin of labial palps with strong teeth and excavations, teeth with somewhat "inverted" orientation showing slightly concave dorsal margin and convex ventral margin (potential unique apomorphy within Corduliidae s.l. and s.s., but as only *M. convergens* was available for study, it must be checked in other species) ; pronotal shield with posterolateral cornicula large and smooth resembling small epaulets ; propleuron with well-developed and acute proepisternum ; abdomen particularly long and narrow (length/width ratio > 3) and with S1-8 of about same width (lateral margins subparallel) (unique within Corduliidae s.l. and s.s.) ; lateral spines absent from S8 and very small on S9.

Adults. – FW Ax1 and Ax2 separated by a secondary antenodal that is not reinforced and HW Ax1 and Ax2 by a weaker reinforced antenodal (unique within Corduliidae s.l. and s.s.) ; FW and HW hypertriangles free (convergent to Oxygastrini **n**. **trib**., Austrophyinae **n**. **subfam**. and Syncorduliinae **n**. **subfam**.) ; male hamuli posteriores with inner branch bearing a strong, acute spine directed ventrally (apparently unique within Corduliidae s.l. and s.s.).

Fig. **3**. *Oxygastra curtisii*. Vesica spemalis in right lateral view (ventral part above).

Other diagnostic characters

Larvae. – Frontal plate subrectangular.

Adults. – Submedian space without supernumerary crossvein (also present in Oxygastrini **n**. **trib**., Austrophyinae n. subfam. and Syncorduliinae **n**. **subfam**.) ; male S1 with pair of ventral processes directed backwards (polarity difficult to establish, could be a plesiomorphy or a reactivated atavistic character, character also present in Austrophyini **n**. **trib**. and *Presba*).

Austrophyinae **n**. **subfam**.

ZooBank : https://zoobank.org/BDC2A6D2-6314-42F3-ABF5-B39EEEA120DA

Included taxa. – Austrophyiini **n**. **trib**. and Lathrocorduliini **n**. **trib**.

Synapomorphies

Larvae. – They are very distinctive and should not be confused with any other Odonata larva. Antennae remarkably built, very stout and pilose with scape + pedicel *ca* as long as or longer than flagellum (unique within Corduliidae s.l. and s.s. and probably also within Cavilabiata Bechly, 1996) ; third antennomere strongly reduced, the shortest, about as long as wide (unique within Corduliidae s.l. and s.s. and probably also within Cavilabiata) ; right and left Md with reduced and widely separated ventral and dorsal molar cusp and with median cusp absent or strongly reduced and almost fused with ventral cusp on right Md (reduction in size and number is a rather rare character, apparently unique within Oxygastridae) ; dorsal distal margin of prementum densely furnished with spine-like setae of different size (considered here as synapomorphic since the density is distinctly higher than in many Libelluloidea and since long and short setae are mixed) ; pronotal shield with a strongly developed lateral cornicula directed backwards to a variable degree.

Adults [adult characters of the Austrophyini. – *Theischingerophya* **n**. **gen**. unknown]. Complete absence of pale/yellow markings, with a largely green metallic synthorax and a blackish abdomen (convergent to *Mesocordulia* and most *Neocordulia* within Oxygastridae) ; FW and HW hypertriangles free (convergent to Oxygastrini **n**. **trib**., Micromidiinae **n**. **subfam**. and Syncorduliinae **n**. **subfam**. within Oxygastridae) ; males without keel on mesotibia (convergent to some individuals of *Micromidia rodericki* within Oxygastridae) ; anterior lamina of the male secondary genitalia with a pair of distinct processes.

Other diagnostic characters

Larvae. – Frontal plate not strongly developed.

Adults. – Submedian space without supernumerary crossvein (convergent to Oxygastrini **n**. **trib**., Micromidiinae **n**. **subfam**. and Syncorduliinae **n**. **subfam**.) ; space limited by the RP3/4 fork and subnodus between RA and RP1/2 lacking crossvein (present also in *Neocordulia* and possibly also in *Siriusocordulia* n. gen. within Oxygastridae).

Possible additional synapomorphy

Adults. – Distal segment of male vesica spermalis derived from the ground plan with a pair of median flagella or with a submedian right expansion and a left submedian flagellum that is entire or split longitudinally (structures perfectly identifiable in Theischinger & Watson 1978, Fig. 23 & 31 thanks to excellent quality drawings).

Lathrocorduliini **n**. **trib**.

ZooBank : https://zoobank.org/21284B3B-02A3-4809-8775-9146B3340D24

Includes only the genus *Lathrocordulia* Tillyard, 1911

Synapomorphies

Larvae. – Antennal scape+pedicel very strong and longer than flagellum (unique within Corduliidae s.s. and s.l.) ; extremely developed antennal scape with a curious shape, three times longer than the longest flagellomere and twice as long as the pedicel, about twice as long as wide, and distinctly bent in dorsal view (unique within Corduliidae s.s. and s.l.) ; antennal pedicel strongly developed about twice as long as wide and 1.5 longer than the longest flagellomere ; distal margin of prementum remarkably straight (a rare character within Libelluloidea) with a narrow dorsal band very densely covered with spine-like setae of varying sizes arranged in three indistinct rows (also a rare character within Libelluloidea) ; right and left Md with "y" tooth (*sensu* Watson 1956 ; uncommon character within Libelluloidea) ; prothorax with poorly differentiated epimeron and episternum.

Adults. – Male terminal segment of vesica spermalis greatly modified from the ground plan with two submedian left long and strong flagella and a submedian right joined expansion (unique within Oxygastridae).

Other diagnostic characters

Larvae. – Frontal plate poorly developed (less developed than in other Austrophyinae, character also present in *Oxygastra*).

Adults. – Female vulvar scales extremely reduced.

Austrophyini **n**. **trib**.

ZooBank : https://zoobank.org/22172B30-E3B4-4B7F-9958-8135AAB1AC81

Included taxa. – *Austrophya* Tillyard, 1909 and *Theischingerophya* **n**. **gen**.

Synapomorphies

Larvae. – Same remarkable general construction of antennae with scape + pedicel about as long as flagellum (unique within Libelluloidea) and with antennomeres 3-6 extremely broad [antennomeres 3-5 with a width/length ratio ≥ 1, antennomere 6 with a width/length ratio > 0.7] (unique within Libelluloidea) ; distal margin of prementum rather densely furnished with spine like setae of various sizes (density lower than in Lathrocorduliini, uncommon within Libelluloidea) ; pronotal shield with pair of well developed cornicula distinctly directed backwards (unique within Corduliidae s.s. and s.l.) ; S9 without lateral spine (convergent to Micromidiinae, and some Macromidiinae, uncommon within Corduliidae s.l.).

Adults [based on *Austrophya*, adults of *Theischingerophya* **n**. **gen**. unknown]. – Anal loop elongate with a single row of four cells in the ground plan (unique within Corduliidae s.s. and s.l.) ; male terminal segment of vesica spermalis modified from the ground plan with a submedian left rather long flagellum and a submedian right joined expansion (unique within Oxygastridae).

Syncorduliinae **n**. **subfam**.

ZooBank : https://zoobank.org/BCD9A0F2-8467-4968-BF0E-1F811AD44557

Included taxa. – Genera *Presba* Barnard, 1933, *Syncordulia* Selys, 1882, and provisionally *Siriusocordulia* **n**. **gen**.

A comprehensive study of the larvae and of the male secondary copulatory apparatus would be necessary to better understand this group. In the current state of knowledge, this taxon is poorly defined and is more a grouping of forms by exclusion of other subfamilies. This new subfamily might be para- or even polyphyletic.

Synapomorphies

Adults. – Eyes bluish-grey in living specimens ; weakly defined Rspl present at least in one pair of wings (somewhat variable from a specimen to another) ; hypertriangles free (convergent to Oxygastrini **n**. **trib**., Micromidiinae **n**. **subfam**. and Austrophyinae **n**. **subfam**. within Oxygastridae) ; FW postdiscoidal field distinctly widening distally between distal third and distal half to wing margin (a variable character with uncertain polarity, convergent to Macromidiinae **n**. **subfam**.) ; field between MA and RP3/4 distinctly widening distally in the ground plan (also a variable character, convergent to some Micromidiinae **n**. **subfam**., greatly inconstant in *Syncordulia*) ; HW CuA moderately curved.

Syncordulia and *Presba* are considered sister genera by similar construction of the hamule posteriores (character considered apomorphic) and by the strong reduction of green metallic reflections on synthorax.

Other diagnostic characters

Adults. – Submedian space without supernumerary crossvein (convergent to Oxygastrini **n**. **trib**., Micromidiinae **n**. **subfam**. and Austrophyinae **n**. **subfam**.) ; Ax1 and Ax2 well separated without secondaries between them ; no well defined Aspl in anal loop ; abdomen with pale markings.

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Résumé

Fleck G., 2026. – Une approche de la taxonomie et de la phylogénie des Oxygastridae sensu Fleck, 2018 basée sur la morphologie larvaire et imaginale (Odonata: Anisoptera). *Faunitaxys*, 14(01) : 1 – 11.

Une phylogénie préliminaire des Oxygastridae sensu Fleck, 2018 est formulée sur la base des caractères larvaires et adultes. Le sous-genre *Mesocordulia* May, 1992 est accepté au rang de genre, notamment en raison de la présence d'un caractère larvaire extraordinaire, le genre *Presba* Barnard, 1933 est rétabli et comprend *P. venator* et *P. legator* **comb**. **nov**., et de nouveaux taxons sont proposés : *Juliecordulia* **n**. **gen**. (monotypique, espèce type *Idomacromia lieftincki*), *Siriusocordulia* **n**. **gen**. (monotypique, espèce type *Syncordulia serendipator*), *Theischingerophya* **n**. **gen**. (monotypique, espèce type *Austrophya monteithorum*), Juliecorduliini **n**. **trib**. (genre *Juliecordulia*), Oxygastrini **n**. **trib**. (genres *Oxygastra*, *Neocordulia* et *Mesocordulia*) avec *Oxygastra* comme groupe frère de (*Neocordulia* + *Mesocordulia*), Lathrocorduliini **n**. **trib**. (genre *Lathrocordulia*), Austrophyiini **n**. **trib**. (genres *Austrophya* et *Theischingerophya*), Oxygastrinae **n**. **subfam**. (tribus Juliecorduliini et Oxygastrini), Macromidiinae **n**. **subfam**. (genre *Macromidia*), Syncorduliinae **n**. **subfam**. (genres *Syncordulia*, *Presba* et provisoirement *Siriusocordulia*), Micromidiinae **n**. **subfam**. (genre *Micromidia*), Austrophyinae **n**. **subfam**. (tribus Austrophyini et Lathrocorduliini). La sous-famille Macromidiinae est considérée comme groupe frère des Oxygastrida n. taxon (Oxygastrida : ((Oxygastrinae : Juliecorduliini + Oxygastrini) + Syncorduliinae + Micromidiinae + (Austrophyinae : Austrophyini + Lathrocorduliini))).

Mots-clés. – Odonata, Anisoptera, Oxygastridae, Libellule, nouveaux genres, nouvelles tribus, nouvelles sous-familles.

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Illustration de la couverture :

Adulte male d'*Oxygastra curtisii* (Ardèche, France).

Crédits:

Günther Fleck : Fig. 1-3.
Pierre Juliand : Couverture.

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